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Online proctoring solution and optimization using Amazon Rekognition & multi-region distribution processing

**About Ginger Webs Pvt Ltd**

**About Challenge**

Intelligent online proctoring solution was needed for conducting online exams via web & mobile devices. This solution should capable of handling the invigilation of 50K students who takes exams at one time simultaneously, with enough intelligence to handle all sorts malpractices and enforcing fair and well proctored examination system, for university and corporate examinations.

Need for such a cutting-edge solution became highly critical especially in times pandemic, which brought huge relief to students and test providers.

Earlier, Ginger was using monitoring of students via screens, which was having issues of manual monitoring.

Ginger Webs Pvt. Ltd. is a Leading Testing and Assessment Solution Provider, driven by an ideology to make unique, easy to use and futuristic applications. Our extensive research and development in education industry helps us to make products that allow end users to achieve maximum with minimum effort. Complicated processes like examination, recruitment, and corporate training made simple by using our products. Apart from education, we also leverage technology and management to varied verticals of the industry.

**AWS Services used**



Amazon Simple

Storage Service (S3)

Amazon API

Gateway



Amazon CloudWatch

Amazon Rekognition

Amazon Lambda

**Proposed Solution**

On various discussions with customer on possible solutions, we proposed a AI based solution in this scenario and create a cutting edge solution using AI services –

* At the time of student’s initial login, when authentication and authorization take place, students’ information is captured In form of multiple images at fractional time differences.
* At the time of student authorization, these images are sent to cloud for processing and training the recoknition model
* During the online examination, every 10 seconds student’s image is captured and sent to cloud
* As Rekognition API has a region-specific Transactions per second (TPS) limit which was creating a huge problem i.e. North-Virginia has 50, Ireland has 50, Mumbai has 5 etc. and students were in tune of 50K so this problem resolved using a analytical function which uses various region wise weights and corresponding probabilities etc.
* Using analytical function compare and detect requests of faces are distributed to multiple regions.
* In detect operation looks for multiple faces, if multiple faces found then displayed at web application window to proctor for further action.
* In compare operation looks for match with initial registered student, if not matched then this is displayed at web application window to proctor for further action.

**Solution Outcome**

It helped enforcing fair examination practices on students and test providers part and could enforce such fair practices and led enriched user experience.

Reduces the count & need of invigilators, who used monitor the students live window which led to cost savings in tune 80%





Diagram

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**Architecture Diagram**

**How AWS services helped Ginger Webs in online proctoring during their tests**

**Rekognition API helped to detect and compare faces and integrating with other AWS services**

Amazon Rekognition is designed to work seamlessly with other AWS services like Amazon S3 and AWS Lambda. We pay for the images and videos that we analyze, and the face metadata that we store thus reducing the cost of using the AI services.

**Retry and Exponential Backoff during any failure of an API request**

With AWS, we can retry for several times if any request fails due to any internal error

**AWS API Gateway helped Ginger Webs in secured single API request along with Cost saving**

API Gateway offers optimized serverless workloads and HTTP backends—they offer up to 71% cost savings and 60% latency reduction. It also helps us manage traffic to your backend systems, so we are free to focus on our business logic and services rather than maintaining infrastructure

**AWS Lambda helped to create multiple API requests internally**

AWS Lambda lets us run code without provisioning or managing servers. We pay only for the compute time you consume. Also, connect with various AWS API’s to acquire various insights from the inputs

**About the Partner**

**MothersonSumi INfotech & Designs Ltd.**

MothersonSumi INfotech & Designs Limited (MIND), a SEI CMMI Level 5 IT services company and the IT back bone of Motherson group. MIND is a trusted technology partner to over 200 clients globally. Our value proposition is in our strength in specific Industry segments and years of experience in the areas of intelligent warehousing, Supply chain enablement, software application development, smart ERP customization, infra managed services, cloud, IoT & Analytics. MIND is serving customers in 41+ countries with a strong team of 1500+ professionals.